

Notes of Potterow Post-Occupancy Evaluation Meeting held 12th November 2012

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20th November 2012

Present: Bill Bordass (Post Occupancy Evaluation Author) Alastair Scobie (Computing Officer, Informatics) David Hamilton (Supervisor, Informatics), David Somervell (Sustainability Adviser), Dougie Williams (Controls Systems Manager), Caroline Overy (Sustainability Office), Alastair Gordon (Project Architect, Bennetts Associates), David Barratt (Engineering & Operations Manager, Estates & Buildings), David Sterratt (Energy Coordinator, School of Informatics).

Prevented: Jim Brown (Premises Manager, College of Science and Engineering)

1 Computing issues

1.1 Sleep (AS)

- There is an approximate 40%/60% server/desktop split. 60% of desktops run DICE (the Informatics computing environment), 10% run the University Windows platform and 30% are self-managed. DICE desktop machines currently go to sleep automatically when users log out. However, many users do not log out at night because they are running jobs or want to keep their development environment open. It would be difficult to set up a system that puts machines to sleep when users are logged in as is difficult to determine the circumstances under which a machine should be put to sleep.
- **Action: AS to organise setting up giving users an option to put machines to sleep on DICE machines.**
- **Action: once this is done, DCS to organise campaign for putting machines to sleep.**

1.2 Disabling or changing operation of the Building UPS (AS, JB)

- There are two pairs of Uninterruptable Power Supplies (UPSs): the server UPS pair (rated at 100kW) and the building UPS pair (rated at 500kW). Within each pair both UPSs are operating continuously as a balanced pair. Each UPS is doing “double-conversion”, i.e. converting the incoming AC power to DC and then converting back to

well-conditioned AC. However, this rectification and inversion causes parasitic losses of power.

- The building UPS pair supplies IT closets and small power in offices, including computers and heaters. The building UPS pair is massively overrated, running around 12% load on average. The efficiency at this loading will not as high as if the loading were greater.
- The server UPS pair supplies the server room and runs around 50% load.
- We discussed various options for improving the efficiency of the UPSs:
 1. Put servers and the building the on current building UPS and decommission the server UPS. This would require considerable wiring, as the UPSs are in different locations. *Bill adds* that ‘from the literature (though this is a bit confusing) I think the Building UPS is a cheaper and less efficient unit than the server UPS too.’
 2. Decommission the building UPS pair altogether. This could be tried out by using the bypass mode. However, this would not provide continuous power for the network kit.
 3. Get rid of the building UPS and provide local UPSs within closets for network kit. However, this would have funding implications.
 4. Put network kit in closets on server UPS. However, there may not be enough spare capacity on the server UPS for the network kit. Also it would require considerable rewiring.
 5. Switch off one of the building UPSs, and put the other UPS into “parallel bypass mode”.
- We should monitor the difference in power consumption any change makes.
- **Action: DB to supply logger so that power upstream and downstream of the Building UPS can be measured.**
- **Action: DB and AS will then switch off one of the Building UPS pair.**
- **Action: DB to speak with manufacturers to investigate hot-swapping.**
- **Action: On basis of this, try mechanical bypass of UPS out of term.**
- **Action: AS to investigate how much spare capacity (headroom) there is on the server UPS.**
- **Action: AS to measure load of the IT closets.**

1.3 Replacing the DX cooling unit in main UPS room (AS, DW)

- The DX cooling unit serving the building UPS room has failed a number of times in the previous year. The DX unit is itself a replacement for the cooling coil from the district cooling originally installed. The DX was installed under contract. If we remove half of building UPS and put the UPS into parallel mode, this should take out some of the heating load.
- This might allow the DX unit to be replaced by a local cooling coil. At present there is not enough space to install a bigger cooling coil. However if half the building UPS is removed there would (a) be more space for a cooling coil and (b) the heat losses would be smaller.
- No action at present, as this depends on the UPS changes.

1.4 Cooling in IT closets (AS, DW)

- The cooling fans in each closet used to be programmed to turn on when the closets were too hot. However, the temperature sensor is in the wrong place, so they are turned on all the time. The annual savings of reinstating control would be £1,600.
- Do we need cooling in closets at all? There is chilled water. Bill observed on his winter visit that the IT closets were quite cool. The IT closets also survived the inadvertent chilled water shut-down during the Christmas-New Year break 2010-11.
- This might be the case now, but not if local UPS units are installed (one of the UPS options).
- **Action: AG will look to see if we could put grilles in the doors, even intumescent (fire-rated) ones.**
- **Action AS and DH will look at putting a temperature logger in one of the IT closets.**

1.5 Hot-spots of machines (AS, DW)

- DH: some internal offices have 8 students and 2 machines each.
- AS: this is not overloaded compared to the building spec.
- BB: the floor voids weren't as well-sealed as they should have been so there isn't enough air movement. A lot of work has been done to seal up floor voids, but there is probably not much more to be done.
- *Bill adds:* 'When I went round the building after the meeting, I found that two rooms reported to be stuffy had floor outlets closed, unbeknown to the occupants. Whether this had been done by a previous occupant to control local draughts or because at times the room got chilly they couldn't say. Another "stuffy" room the occupants thought

was fine, but they had not been there at the time of your [the comfort] survey and may not have experienced summer conditions.'

- No action here.

1.6 Energy display (AS, DW)

- It would be good to have the live energy display developed by Meterology on the plasma screen at the entrance - it works in other departments.
- **Action: DCS will raise at Building Committee.**
- **Action: DW to put us in contact with departments who have deployed it successfully.**

2 Lighting

2.1 Moving kitchen lights and atrium balconies to local sensor control (JB)

- At the last POE meeting Jim Brown reported that Mike Riley has plans to remove the central building control from the kitchen lights and move these to local control (i.e. sensors) so that they are only activated when needed.
- Since the meeting, Mike Riley has reported that:
 - Each kitchen (both in the Wolfson wing and off the atrium) is going to be controlled by a separate sensor that detects both movement (with a PIR) and light levels. The sensors have been ordered.
 - The atrium is going to be controlled by a separate PIR/light sensor.

2.2 Reprogramming lighting controls (JB, DH)

- As discussed at the the POE meeting on 26th September, we need a strategy for reprogramming the lighting to reduce their output and, without introducing annoying switching on and off, the length of time they are on for.
- Works have the fully-featured lighting controller and DH has a simpler version.
- **Action: CO to contact DH and JB about the machine to have training session on the light-changing gizmo.**
- We will work out where to go from there.
- **Action: AG to circulate one page light switch manual.**
- **Action: DCS to tell Informatics colleagues about this.**

3 Ventilation/heating

3.1 Problematic rooms: causes and remedies (BB)

- BB has identified the reasons for some rooms being particularly cold. He has some ideas about how to remedy these problems. However this would need funding.
- It would be desirable for BB to carry on with this work.
- Initially the trench heating had not performed to specification and needed to be upgraded. In some rooms, this was still not sufficient to meet the design requirement. Additional radiators had been specified, but it had been decided to wait and see before installing them. Bill cautioned that air leakage tends to be concentrated in the rooms with trench heating owing to the more complex perimeter detailing, so the sizing of these radiators might not be sufficient.
- DS has asked for more funding from E&B
- **Action: DCS could draft one page summary for the HoS saying that Informatics wants action on problematic rooms. He will raise this course of action at Building Committee.**

3.2 Improving airflow to stuffy offices (DW,AB)

- DB had idea about blocking swirls (vents) in perimeter offices and getting these residents to use windows for ventilation.
- BB doesn't think this will work. He thinks that closing the vents will lead to increase in a typical office from 4Pa to 4.5Pa. He thinks that connecting the ventilation trunking directly to floor vents in problematic rooms will give a 12Pa difference. As flow is proportional to square root of pressure, this should have much greater effect on comfort levels. This should be trialled on one room that is acutely bad. Pressures on the fifth floor are in the region of 3 Pa.
- Will this take more air from the trunk duct? BB thinks not.
- DW: Need to make sure that vents are not too close to desks, otherwise will be perceived as drafts.
- **Action: DB will try out the minimum option (closing vents) in one wing.**
- **Action: BB will send DB data about where problematic rooms are.**

3.3 Opportunities for more efficient plant operation (BB)

- DW outlined the changes that have resulted considerable reductions in the fan speed.

4 Energy data

4.1 Main heat metering (BB)

- Heat meters are crossed between DSB and the Forum.
- One heat meter may be out by a factor of 10.
- We need to check the heat meters are connected correctly in new buildings.
- AG would like some notes about what managers want from metering.
- Quite simple: all meters should be verified.
- Commissioning manager should be contracted by University?

4.2 Analysis of data from zonal meters (DW, DCS)

- DW can advise on how meter reading could be automated.

4.3 Measuring effect of AHU consumption (DW)

- DW has not had time to measure the effect of the changes to the ventilation system on power consumption - although it would seem likely that it has made a large contribution to the fall in electricity use of around 15% this year.

5 Report to estates committee

- Will make case for carrying on with Bill's work.